## Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

## Listing of Claims:

1. (Currently amended) A method to predict athletic performance in an individual comprising:

      a) obtaining one or more samples from an individual;

      [[a]] b) analyzing the sample ~~screening the individual~~ for the presence of one or more genetic variations in the α–actinin-3 (ACTN3) gene; and

      [[b]] c) predicting athletic performance based on the presence of the one or more genetic variations.

2. (Original) The method of claim 1, wherein the individual is a human.

3. (Original) The method of claim 1, wherein the individual is a horse, a dog or a camel.

4. (Previously presented) The method of claim 1, further comprising screening the individual for a 1747 C>T single nucleotide polymorphism (SNP) in the ACTN3 gene.

5. (Previously presented) The method of claim 1, further comprising genotyping the individual at the ACTN3 locus.

6. (Original) The method of claim 5, wherein the presence of at least one copy of the 577R allele of the ACTN3 gene is positively associated with sprinting or power performance.

7. (Original) The method of claim 6, wherein genotyping the individual as a 577RR genotype is positively associated with sprinting or power performance.

8.      (Original)  The method of claim 6, wherein genotyping the individual as a 577XX genotype is negatively associated with sprinting or power performance.

9.      (Original)  The method of claim 6, wherein genotyping the individual as a 577XX genotype is positively associated with endurance performance.

10.      (Currently amended)  The method of claim 6, wherein genotyping the individual as a~~577RX~~ a 577RX genotype is positively associated with sprinting or power performance in female individuals.

11.      (Original)  The method of claim 6, wherein genotyping the individual as a 577RX genotype is negatively associated with endurance performance in female individuals.

12.      (Previously presented)  The method of claim 1, further comprising measuring the amount of ACTN3 protein present in the individual's skeletal muscle.

13.      (Original)  The method of claim 12, wherein the amount of ACTN3 protein is measured using an antibody specific for the ACTN3 protein.

14.      (Previously presented)  The method of claim 1, further comprising measuring the amount of ACTN3 messenger RNA (mRNA) expressed in the individual's skeletal muscle.

15.      (Original)  The method of claim 4, further comprising identifying the 1747 C>T SNP alleles in the individual's genomic DNA by DNA sequencing, allele-specific hybridization, allele-specific amplification or restriction fragment length polymorphism analysis.

16.      (Previously presented)  The method of claim 4, further comprising screening the individual for the presence of one or more additional SNPs in the ACTN3 gene.

17.     (Canceled)  The method of claim 16, wherein the one or more additional SNPs are selected from the group consisting of the SNPs listed in TABLE 3.

18.     (Previously presented)  The method of claim 1, further comprising screening the individual for the presence of one or more genetic variations in at least one other gene.

19.     (Canceled)  The method of claim 18, wherein the at least one other gene is selected from the group consisting of the genes listed in TABLE 4.

20.     (Canceled)  The method of claim 19, further comprising screening the individual for the presence of the ACE (angiotensin-converting enzyme) I allele and the ACE D allele.

21.     (Canceled)  The method of claim 20, wherein the ACE I allele is positively associated with endurance performance.

22.     (Canceled)  The method of claim 20, wherein the ACE D allele is positively associated with sprinting or power performance.

23.     (Canceled)  The method of claim 19, further comprising screening the individual for the presence or absence of an ADRA2A (Alpha-2A-adrenergic receptor) allele.

24.     (Previously presented)  The method of claim 1, further comprising screening the individual using a test selected from the group consisting of $VO_2$ maximum, anaerobic threshold test, Wingate test, critical power, resting metabolic rate, body composition, speed testing, power testing, strength testing, flexibility testing, muscle biopsy, fast twitch fiber test and slow twitch fiber test.

25.     (Currently amended)  ~~A method of optimizing a training program~~ The method of claim 1, further comprising

a) screening the individual for the presence of one or more genetic variations in the α-actinin-3 (ACTN3) gene; and

b) selecting the individual's training program based on the presence of the one or more genetic variations to optimize strength performance, power performance , endurance performance or a combination thereof.

26.     (Original)  The method of claim 25, wherein the individual is a human, a horse, a dog or a camel.

27.     (Previously presented)  The method of claim 25, further comprising screening the individual for a 1747 C>T single nucleotide polymorphism (SNP) in the ACTN3 gene.

28.     (Previously presented)  The method of claim 25, further comprising genotyping the individual at the ACTN3 locus.

29.     (Currently amended)  A method of selecting a sport or sporting event for an individual The method of claim 1, further comprising selecting the individual's sprint/power type sport or event or, otherwise, and or endurance sport or event on the basis of the presence of the one or more genetic variations.

30.     (Original)  The method of claim 29, wherein the individual is a human, a horse, a dog or a camel.

31.     (Previously presented)  The method of claim 29, further comprising screening the individual for a 1747 C>T single nucleotide polymorphism (SNP) in the ACTN3 gene.

32.     (Previously presented)  The method of claim 29, further comprising genotyping the individual at the ACTN3 locus.

33.     (New)  The method of claim 1, wherein analyzing the sample further comprises analyzing DNA of the sample.


34.     (New)  The method of claim 1, wherein the genetic variation is a SNP.


35.     (New)  A method to predict athletic performance in an individual comprising:

    a)  obtaining one or more samples from an individual;

    b)  analyzing the sample for the presence of one or more genetic variations in the ACTN3 gene;

    c)  identifying ACTN3 577 genotype (577XX, 577RX and 577RR); and

    d)  predicting athletic performance based on the presence of the one or more genetic variations in the ACTN3 gene and the ACTN3 577 genotype.


36.     (New)  The method of claim 35, further comprising screening the individual for a 1747 C>T single nucleotide polymorphism (SNP) in the ACTN3 gene.


37.     (New)  The method of claim 35, further comprising identifying the ACTN3 577 genotype using a protein assay.


38.     (New)  The method of claim 37, wherein the assay is an ELISA assay.